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**Broadband Integrated Services Digital Network (B-ISDN);
Digital Subscriber Signalling System No. two (DSS2) protocol;
B-ISDN user-network interface layer 3
specification for the point-to-multipoint call/bearer control;
Part 4: Abstract Test Suite (ATS) and partial Protocol
Implementation eXtra Information for Testing (PIXIT) proforma
specification for the user**

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Foreword

This draft European Telecommunication Standard (ETS) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

This ETS is part 4 of a multi-part standard covering the Digital Subscriber Signalling System No. two (DSS2) protocol specification for the Broadband Integrated Services Digital Network (B-ISDN); User-network layer 3 specification for point-to-multipoint call/bearer control; as described below:

Part 1: "Protocol specification [ITU-T Recommendation Q.2971 (1995), modified]";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation Extra Information for Testing (PIXIT) proforma specification for the user".

Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";

Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation Extra Information for Testing (PIXIT) proforma specification for the network".

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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1 Scope

This fourth part of ETS 300 771 specifies the user Abstract Test Suite (ATS) for the T_B reference point or coincident S_B and T_B reference point (as defined in ITU-T Recommendation I.413 [10]) of implementations conforming to the standards for the signalling user-network layer 3 specification for point-to-multipoint call/connection control of the Digital Subscriber Signalling System No. two (DSS2) protocol for the pan-European Broadband Integrated Services Digital Network (B-ISDN), ETS 300 771-1 [1].

A further part of this standard specifies the Test Suite Structure and Test Purposes (TSS&TP) related to this ATS and partial PIXIT proforma. Other parts specify the TSS&TP and the ATS and partial PIXIT proforma for the Network side of the T_B reference point or coincident S_B and T_B reference point of implementations conforming to ETS 300 771-1 [1].

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 771-1 (1995): "Broadband Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; B-ISDN user-network interface layer 3 specification for point-to-multipoint call/bearer control; Part 1: Protocol specification [ITU-T Recommendation Q.2971 (1995), modified]".

[2] ETS 300 771-2: "Broadband Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; B-ISDN user-network interface layer 3 specification for point-to-multipoint call/bearer control; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

NOTE: Part 2 not yet available.

[3] ETS 300 771-3 (1997): "Broadband Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; B-ISDN user-network interface layer 3 specification for point-to-multipoint call/bearer control; Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification for the user".

[4] ETS 300 443-1 (1996): "Broadband Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; B-ISDN user-network interface layer 3 specification for basic call/bearer control; Part 1: Protocol specification [ITU-T Recommendation Q.2931 (1995), modified]".

[5] ISO/IEC 9646-1 (1994): "Information technology - Open systems interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[6] ISO/IEC 9646-2 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification".

[7] ISO/IEC 9646-3 (1992): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".

[8] ISO/IEC 9646-4 (1996): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realization".

- [9] ISO/IEC 9646-5 (1996): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the conformance assessment process".
- [10] ITU-T Recommendation I.413 (1993): "B-ISDN user-network interface".
- [11] ETS 300 443-2 (1996): "Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; B-ISDN user-network interface layer 3 specification for basic call/bearer control; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

Implementation Under Test (IUT): See ISO/IEC 9646-1 [5].

System Under Test (SUT): See ISO/IEC 9646-1 [5].

Abstract Test Suite (ATS): See ISO/IEC 9646-1 [5].

Protocol Implementation Conformance Statement (PICS): See ISO/IEC 9646-17 [5].

PICS proforma: See ISO/IEC 9646-1 [5].

Protocol Implementation eXtra Information for Testing (PIXIT): See ISO/IEC 9646-1 [5].

PIXIT proforma: See ISO/IEC 9646-1 [5].

Lower Tester (LT): See ISO/IEC 9646-1 [5].

Upper Tester (UT): See ISO/IEC 9646-1 [5].

Point of Control and Observation (PCO): See ISO/IEC 9646-1 [5].

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply :

ATM	Abstract Test Method
ATS	Abstract Test Suite
ExTS	Executable Test Suite
IUT	Implementation Under Test
LT	Lower Tester
MOT	Means Of Testing
PCO	Point of Control and Observation
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
SUT	System Under Test
TCP	Test Co-ordination Procedures
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

4 Abstract Test Method (ATM)

The remote test method is applied for the user ATS. The Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3. This PCO is named "L0" (for Lower). The L0 PCO is used to control and observe the behaviour of the Implementation Under Test (IUT) and test case verdicts are assigned depending on the behaviour observed at this PCO.

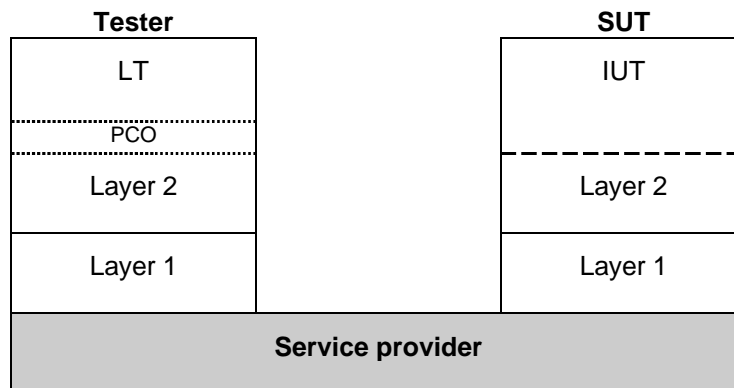


Figure 1: Remote test method

ISO/IEC 9646-2 [6] allows the informal expression of Test Co-ordination Procedures (TCP) between the SUT upper layer(s) and the LT. In the ATS contained in annex C, TCP is achieved by use of a second "informal" PCO, called "O" (for Operator). This PCO is used to specify control but not observation above the IUT and consequently, events at this PCO are never used to generate test case verdicts. The use of this O PCO is regarded as a preferred alternative to the use of the implicit send event, in that it allows the ATS to specify in a clear and meaningful way what actions are required to be performed on the IUT.

5 Untestable test purposes

There are no untestable test purposes associated with this ATS.

6 ATS to TP map

The identifiers used for the Test Purposes (TPs) are reused as test case names. Thus there is a straightforward one-to-one mapping.

7 PCTR conformance

A test laboratory, when requested by a client to produce a PCTR, is required, as specified in ISO/IEC 9646-5 [9], to produce a PCTR conformant with the PCTR template given in annex B of ISO/IEC 9646-5 [9].

Furthermore, a test laboratory, offering testing for the ATS specification contained in annex C, when requested by a client to produce a PCTR, is required to produce a PCTR conformant with the PCTR proforma contained in annex A of this ETS.

A PCTR which conforms to this PCTR proforma specification shall preserve the content and ordering of the clauses contained in annex A. Clause A.6 of the PCTR may contain additional columns. If included, these shall be placed to the right of the existing columns. Text in italics may be retained by the test laboratory.

8 PIXIT conformance

A test realizer, producing an executable test suite for the Abstract Test Suite (ATS) specification contained in annex C, is required, as specified in ISO/IEC 9646-4 [8], to produce an augmented partial PIXIT proforma conformant with this partial PIXIT proforma specification.

An augmented partial PIXIT proforma which conforms to this partial PIXIT proforma specification shall, as a minimum, have contents which are technically equivalent to annex B. The augmented partial PIXIT proforma may contain additional questions that need to be answered in order to prepare the Means Of Testing (MOT) for a particular IUT.

A test laboratory, offering testing for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-5 [9], to further augment the augmented partial PIXIT proforma to produce a PIXIT proforma conformant with this partial PIXIT proforma specification.

A PIXIT proforma which conforms to this partial PIXIT proforma specification shall, as a minimum, have contents which are technically equivalent to annex B. The PIXIT proforma may contain additional questions that need to be answered in order to prepare the test laboratory for a particular IUT.

9 ATS Conformance

The test realizer, producing a MOT and Executable Test Suite (ExTS) for this Abstract Test Suite (ATS) specification, shall comply with the requirements of ISO/IEC 9646-4 [8]. In particular, these concern the realization of an ExTS based on each ATS. The test realizer shall provide a statement of conformance of the MOT to this ATS specification.

An ExTS which conforms to this ATS specification shall contain test groups and test cases which are technically equivalent to those contained in the ATS in annex C. All sequences of test events comprising an abstract test case shall be capable of being realized in the executable test case. Any further checking which the test system might be capable of performing is outside the scope of this ATS specification and shall not contribute to the verdict assignment for each test case.

Test laboratories running conformance test services using this ATS shall comply with ISO/IEC 9646-5 [9].

A test laboratory which claims to conform to this ATS specification shall use an MOT which conforms to this ATS.

Annex A (normative): Protocol Conformance Test Report (PCTR) proforma

Notwithstanding the provisions of the copyright clause related to the text of this ETS, ETSI grants that users of this ETS may freely reproduce the PCTR proforma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.

A.1 Identification summary

A.1.1 Protocol conformance test report

PCTR number:	
PCTR Date:	
Corresponding SCTR number:	
Corresponding SCTR date:	
Test Laboratory identification:	
Test Laboratory Manager:	
Signature:	

A.1.2 IUT identification

Name:	
Version:	
Protocol specification:	ETS 300 771-1
PICS:	
Previous PCTRs (if any)	

A.1.3 Testing environment

PIXIT Reference number:	
ATS Specification:	ETS 300 771-4
Abstract Test Method:	Remote test method (see ISO/IEC 9646-2)
Means of Testing identification:	
Dates of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	

A.1.4 Limits and reservations

Additional information relevant to the technical contents or further use of the test report, or to the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

A.1.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

A.2 IUT Conformance status

This IUT has or has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause A.3 of this report) and there are no "FAIL" verdicts to be recorded (in clause A.6) strike the words "has or", otherwise strike the words "or has not".

A.3 Static conformance summary

The PICS for this IUT is or is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

A.4 Dynamic conformance summary

The test campaign did or did not reveal errors in the IUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause A.6 of this report) strike the words "did or", otherwise strike the words "or did not".

Summary of the results of groups of tests:

A.5 Static conformance review report

If clause A.3 indicates non-conformance, this clause itemises the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

A.6 Test campaign report

ATS Reference	Selected ? (Y/N)	Run ? (Y/N)	Verdict	Observations
Signalling procedures at the coincident S_B/T_B and at the T_B reference points				
L3MU_01_01				
L3MU_01_02				
L3MU_01_03				
L3MU_01_04				
L3MU_01_05				
L3MU_01_06				
L3MU_01_07				
L3MU_01_08				
L3MU_01_09				
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ATS Reference	Selected ? (Y/N)	Run ? (Y/N)	Verdict	Observations
Procedures at the T _R reference point for interworking with private B-ISDNs				
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A.7 Observations

Additional information relevant to the technical content of the PCTR are given here.

Annex B (normative): Partial PIXIT proforma

Notwithstanding the provisions of the copyright clause related to the text of this ETS, ETSI grants that users of this ETS may freely reproduce the partial PIXIT proforma in this annex so that it can be used for its intended purpose and may further publish the completed PIXIT.

B.1 Identification summary

PIXIT Number:

Test Laboratory Name:

Date of Issue:

Issued to:

B.2 Abstract test suite summary

Protocol Specification: ETS 300 771-1
ATS Specification: ETS 300 771-4
Abstract Test Method: Remote test method (see ISO/IEC 9646-2)

B.3 Test laboratory

Test Laboratory Identification:

Accreditation status of the test service:

Accreditation reference:

Test Laboratory Manager:

Test Laboratory contact:

Means of Testing:

Test Laboratory instructions for Completion:

B.4 Client (of the Test Laboratory)

Client Identification:

Client Test manager:

Client contact:

Test Facilities required:

B.5 SUT

Name:

Version:

SCS Reference:

Machine configuration:

Operating System Identification:

IUT Identification:

PICS (all layers):

Limitations of the SUT:

Environmental Conditions:

B.6 Protocol information

B.6.1 Protocol identification

Specification reference: ETS 300 771-1

Protocol Version:

PICS Reference:

NOTE: The PICS Reference should reference a completed PICS which is conformant with the PICS proforma contained in ETS 300 443-2 and ETS 300 771-2.

B.6.2 Configuration to be tested

Table B.1: Configuration to be tested

Item	Configuration Is the access to be tested ...	Supported Y/N
1.1	of the T _B reference point type?	
1.2	releasing layer 2 after entering the Null link state U0?	
1.3	stable in Call Received link state U7 and the Party Alerting Delivered party state P3 (i.e. CONNECT and ADD PARTY ACKNOWLEDGE messages are not sent automatically)?	

B.6.3 Stimuli for the IUT

Table B.2: Actions required to stimulate the IUT

Item	Action What actions, if possible, have to be taken to cause the IUT to ...	Supported Y/N	Stimulus (action taken)
2.1	drop all parties, the IUT being the root user?		
2.2	drop all parties, the IUT being a private B-ISDN? (only, if PIXIT item 1.1 is supported)		
2.3	send a NOTIFY message related to a specific ATM endpoint within the private B-ISDN towards the tester? (only, if PIXIT item 1.1 is supported)		

B.6.4 Test management timers

Table B.3: Timer values

Item	Timer Give a value for the timer that is used ...	Value (in seconds)
3.1	as network side value for T310 (default value 10 seconds).	
3.2	as network side value for T399 (no default value).	
3.3	to wait for the IUT to respond to a stimulus sent by the tester (TAC).	
3.4	to control that the IUT does not respond to a stimulus sent by the tester (TNOAC).	
3.5	to wait for the test operator to perform an implicit send action (TWAIT).	
NOTE:	The IUT provider may fill in a value range rather than a fixed value for the test management timers. During test execution the test laboratory will choose specific values for the timers dependant on the means of testing used. These specific values may even be beyond the range given by the IUT provider, if this is necessary for achieving satisfactory test results.	

B.6.5 Parameter Values

Table B.4: Parameter values

Item	Parameter values Give ...	Value
4.1	a coding of a Bearer capability information element, which the IUT is compatible with, for the purpose of accepting incoming calls.	
4.2	a coding of the Type of number and the Addressing/Numbering plan identification fields of the Called party number information elements to be sent to the IUT.	
4.3	a coding of the number digits for the first party of a point-to-multipoint call to be sent to the IUT.	
4.4	a coding of the number digits for the second party of a point-to-multipoint call to be sent to the IUT. (only, if PIXIT item 1.1 is supported)	
4.5	a coding of the forward peak cell rate (CLP = 0) to be sent to the IUT.	
4.6	a coding of the forward peak cell rate (CLP = 0 + 1) to be sent to the IUT.	
4.7	a coding for a cumulative transit delay value that is unacceptable for the IUT. This value will be sent in the End-to-end transit delay information element of an ADD PARTY message to the IUT for the purpose of rejecting the add-on of the particular party. (note)	
4.8	a coding of a Notification indicator information element to be sent to the IUT.	
4.9	an invalid coding of a Notification indicator information element to be sent to the IUT for the purpose of testing the IUT's reaction on the receipt of a non-mandatory information element with content error. (note)	
4.10	a value for the preferred VPCI.	
4.11	a value for the preferred VCI.	
4.12	a value for an unrecognised message type.	
4.13	a value for an unrecognised information element identifier.	
NOTE:	This fields need only be completed, if the relevant coding exists.	

Annex C (normative): Abstract Test Suite (ATS)

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [7].

The ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the contents table. The ATS itself contains a test suite overview part which provides additional information and references.

C.1 The TTCN Graphical form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in a PostScript file 771_4_1.PS contained in archive 7714_ep.LZH which accompanies the present document.

C.2 The TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file 771_4_1.MP contained in archive 7714_ep.LZH which accompanies the present document.

NOTE: According to ISO/IEC 9646-3 [7], in case of a conflict in interpretation of the operational semantics of TTCN.GR and TTCN.MP, the operational semantics of the TTCN.GR representation takes precedence.

History

Document history	
February 1998	Public Enquiry PE 9824: 1998-02-13 to 1998-06-12